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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/559,571	12/05/2005	Yasushi Sato	0670-7064	8897
31780	7590	66/12/2009	EXAMINER	
ERIC ROBINSON			LERNER, MARTIN	
PMB 955			ART UNIT	PAPER NUMBER
21010 SOUTHBANK ST.			2626	
POTOMAC FALLS, VA 20165				
		MAIL DATE	DELIVERY MODE	
		06/12/2009	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/559,571	<b>Applicant(s)</b> SATO, YASUSHI
	<b>Examiner</b> MARTIN LERNER	<b>Art Unit</b> 2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 02 February 2006.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1 to 41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1 to 41 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date: _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date: _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Specification***

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Speech Synthesis for Synthesizing Missing Parts

2. The disclosure is objected to because of the following informalities:

On page 29, lines 2 to 3; on page 29, line 12; on page 29, line 18; on page 48, line 20; on page 48, line 25; and on page 49, line 1, shouldn't "decompression section 43" should be "decompression section 8"? The Specification talks about data supplied by search section 6, so it appears more likely that decompression section 8 would be involved than decompression section 43, which is closer to search section 42. (See Figures 1 and 3.)

On page 41, line 24, there should be a period at the end of the sentence.

On page 68, line 17, "stringent that" should be "stringent than".

On page 74, line 5, "stringent that" should be "stringent than".

Appropriate correction is required.

### ***Claim Objections***

3. Claims 29 and 41 are objected to because of the following informalities:

Claims 29 and 41 appear to be duplicate claims. Both depend from claim 25, and both appear to set forth identical subject matter.

Appropriate correction is required.

***Claim Rejections - 35 USC § 101***

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 37 and 38 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Independent claims 37 and 38 are directed to non-statutory subject matter because they set forth a computer program without being recorded in a computer-readable medium. The USPTO takes the position that computer programs, *per se*, represent non-statutory subject matter. Applicant should amend independent claims 37 and 38 to include a computer-readable medium having program instructions for storing a computer program.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7. Claims 23, 35, and 37 are rejected under 35 U.S.C. 102(a) as being anticipated by *Reynar et al.*

Regarding independent claims 23, 35, and 37, *Reynar et al.* discloses a speech synthesis device, method, and computer program, comprising:

"a first storage means for storing a plurality of pieces of voice unit data representative of one or more speech words" – stored audio data 270 is a long-term storage medium for converting speech input 290 from a speech recognition program 240; stored audio data 270 may later be accessed for audio playback (column 9, lines 5 to 10: Figure 2);

"a selection means for selecting voice unit data whose reading is common with a speech word composing inputted sentence information from the plurality of pieces of voice unit data stored in the first storage means" – if multi-source input and playback utility 200 determines that stored audio data 270 is linked to a word, then the utility retrieves this audio data; a user selects a text portion of a document which he desires the multi-source input and playback utility to play; the multi-source input and playback utility 200 determines whether the word is linked to stored audio data 270 saved from a previous dictation session (column 11, lines 33 to 56: Figure 4: Steps 410 and 415);

"a missing part synthesis means, for a speech word among the sentence information for which the selection means could not select the voice unit data, for synthesizing speech data representative of a desired speech waveform" – alternately, utility 200 may determine that no speech is linked to the word; in this event, the utility checks for the existence of a TTS entry 220 corresponding to the current word; if such a

TTS entry 220 exists, the TTS module 137 retrieves the TTS entry and returns it to the word processor 210 (column 12, lines 9 to 27: Figure 4: Steps 410, 425, 430, and 440);

"a synthesis means for combining the voice unit data selected from the selection means and the speech data synthesized by the missing part synthesis means to create data representative of a synthesis speech corresponding to the sentence information" – word processor 210 parses each word within the text selection in turn, and retrieves and plays either stored audio data 270 or a TTS entry 220; to a user of the multi-source input and playback utility 200, a continuous stream of mixed stored audio data and TTS entries is heard, sounding out the text selection (column 10, lines 43 to 50: Figure 2).

"wherein the missing part synthesis means has a second storage means for storing a plurality of pieces of data representative of one or more pitches of voice waveform fragments" – optionally, the audible characteristics of the TTS entry 220, such as pitch, tone, and speech, may be manipulated by the utility prior to playback in order to more closely match the sound of the TTS entry to that of the stored audio data (column 12, lines 31 to 35: Figure 4); implicitly, an TTS entry will have at least "one pitch", which can then be manipulated prior to playback, and is stored in a TTS entry database 220 ("a second storage means") (Figure 2);

"wherein data representative of voice waveform fragments composing the speech word whose voice unit data could not be selected is acquired from the second storage means and the acquired data is mutually combined to synthesize the speech data representative of the desired speech waveform" – word processor 210 parses each word within the text selection in turn, and retrieves and plays either stored audio

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data 270 or a TTS entry 220; to a user of the multi-source input and playback utility 200, a continuous stream of mixed stored audio data and TTS entries is heard, sounding out the text selection (column 10, lines 43 to 50: Figure 2).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 24 to 29, 34, 36, and 38 to 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Reynar et al.* in view of *Kato et al.* (EP '072).

Concerning independent claims 34, 36, and 38, *Reynar et al.* discloses a speech synthesis device, method, and computer program, comprising a first storage means, a selection means, and a missing part synthesis means of independent claims 23, 35, and 37, but does not expressly disclose the limitations of "wherein the first storage means stores phonetic data representative of a reading of the voice unit data with the phonetic data being associated with the voice unit data, and wherein the selection means operates to handle voice unit data which is associated with the phonetic data representative of a reading matching with the reading of a speech word composing the sentence information as voice unit data whose reading is common with the speech word." *Reynar et al.* suggests that stored audio data 270 corresponds to phonetic data from speech recognition. (Column 9, Lines 2 to 10) However, *Reynar et al.* doesn't

disclose choosing a voice unit from a plurality of alternative voice units that is associated with a desired reading of a speech word in the context of a sentence. Still, Kato *et al.* (*EP '072*) teaches a speech synthesizing system and speech synthesizing method, where speech synthesis is performed taking into account a construction of a sentence. (¶[0007] - ¶[0008]) A prosodic data retrieving section 140 searches prosodic data stored in prosodic information database 130 in response to output from language processing section 120, and outputs the search result. The retrieval keys that match the search key to a certain degree are selected as retrieval candidates, and of the selected candidates, the key having the highest degree of matching is selected. (¶[0062] - ¶[0063]) Prosodic information corresponds to "phonetic data representative of a reading of the voice data unit". An objective is to provide a speech synthesis system capable of generating natural sounding speech from arbitrary input texts having good sound quality. (¶[0009]) It would have been obvious to one having ordinary skill in the art to store phonetic data representative of a reading of the voice unit data so as to match a reading of a word in a sentence by prosody as taught by Kato *et al.* (*EP '072*) in a multi-source input and playback utility of Reynar *et al.* for a purpose of generating natural sounding speech having good sound quality.

Concerning claims 24 to 27 and 39, Kato *et al.* (*EP '072*) teaches matching prosody. (¶[0062] - ¶[0063]) Prosody is equivalent to "cadence". The retrieval keys that match the search key to a certain degree are selected as retrieval candidates, and of the selected candidates, the key having the highest degree of matching is selected. Implicitly, those candidates that do not have the highest degree of matching are

excluded ("to exclude from the objects of selection voice unit data whose cadence does not match with the cadence prediction result under the predetermined conditions").

Concerning claims 28 to 29 and 40 to 41, *Reynar et al.* discloses audio characteristics include pitch, tone, and speed. (Column 12, lines 31 to 35) *Kato et al.* (*EP '072*) teaches that prosodic information database 130 stores a fundamental frequency pattern, and prosodic data retrieval section 140 retrieves a fundamental frequency pattern having the highest match. (¶[0062] - ¶[0063]) Prosody is equivalent to "cadence", and a fundamental frequency pattern corresponds to "a time variation in pitch" because the fundamental frequency is the same as "pitch", and the pattern corresponds to its time evolution. See Figures 2 to 4 of *Kato et al.* (*EP '072*).

10. Claims 30 to 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Reynar et al.* in view of *Kato et al.* (*EP '072*) as applied to claims 23 to 25 above, and further in view of *Chihara*.

*Reynar et al.* discloses audio characteristics include pitch, tone, and speed. (Column 12, lines 31 to 35) However, *Reynar et al.* suggests manipulating the speed characteristics of a TTS entry, but does not expressly say that utterance speed conversion means acquires utterance speed data specifying conditions, selecting or converting speech data and/or voice unit data at a speed fulfilling the specified conditions, and eliminating or adding segments by the utterance speed conversion means. Still, *Chihara* teaches a method of controlling high-speed reading in a text-to-speech conversion system, where control factors are required to predict a duration

length of each phoneme or word. The prediction uses pieces of information such as the phoneme, the kind of adjacent phonemes, the number of mora in the phrase, and the position in the sentence, which are sent to a duration estimation section. The predicted result is sent to a duration correcting section to correct the predicted value where the user designates the utterance speed. (Column 5, Lines 34 to 67: Figure 20) At a high utterance speed, a number of superimposed voice segments is subtracted ("by eliminating a segment") to make the waveform, and at a low utterance speed, the number of superimposed segments is repeated ("adding a segment") for making the waveform. (Column 6, Lines 1 to 11: Figure 21) An objective is to control reading speed from a phoneme and prosody character string including accent and intonation. (Column 1, Lines 19 to 28: Figure 15) It would have been obvious to one having ordinary skill in the art to provide utterance speed conversion at a speed fulfilling specified conditions as taught by *Chihara* in a multi-source input and playback utility of *Reynar et al.* for a purpose of controlling reading speed from a prosody character string including accent and intonation.

### **Conclusion**

11. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

Kato et al. ('309) is the equivalent in the United States of Kato et al. (EP '072). Kondo et al., Ohtsuka et al., Yamada, Imai et al., Nishimura et al., Kasai et al. ('530), and Kasai et al. ('962) disclose related art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARTIN LERNER whose telephone number is (571)272-7608. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Martin Lerner/  
Primary Examiner  
Art Unit 2626  
June 11, 2009